A Community Guide

to

Green Affordable Housing

in

Indianapolis

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This guide is online @

http://www.hundredyear.org/manifesto.aspx

http://www.sustainlane.us

1305 (left) & 1301 Pleasant Street, Fountain Square neighborhood

Southeast Neighborhood Development 'Fab for Less' 2006

1305 is a renovated circa 1879 cottage, 1301 is urban infill new construction.
Both homes feature healthy, high performance green design and construction.

http://www.sendcdc.org

About this Guide

A Community Guide to Green Affordable Housing in Indianapolis is an introduction to green building concepts aimed at community leaders, developers, builders and lenders working on affordable housing projects in Indianapolis. The purpose of this guide *is not* to serve as a technical 'How To' manual, but rather as a touch point and springboard for further discussion and investigation. This guide addresses the common 'What' and 'Why' questions surrounding the topic of green building and includes references and links to a wealth of additional resources available in print and on the web.

The information in this guide is a distillation of building science research, hands-on experience, objective case study analyses, and candid conversations with affordable housing developers, contractors, funders, lenders, city employees, and community development professionals working in Indianapolis and elsewhere. Information gleaned from these key informant interviews has helped to inform both the content and format of this guide. The resource pages include references to books and periodicals, as well as links to online content such as white papers, industry and advocacy groups, education and resource centers, conferences and events, government agencies, and more.

Like green building, successful community revitalization is a holistic process. It is my hope that this primer will serve as a common reference point as well as a point of departure for community leaders and community and economic development professionals that wish to integrate green building principles into their workaday toolbox. I am also hopeful that the ideas presented in this guide will catalyze further conversation and community action as we chart a path toward making Indianapolis a world-class *green* city.

How to Use this Guide

This guide has been designed as a series of two-sided information sheets. Topic headings and discussion points are on the front of each sheet, while resources relevant to each topic are on the back. There is also a glossary with definitions of acronyms and terms that appear in the text. For maximum readability, the electronic version of this guide is best viewed as pairs of side-by-side pages. The 'front' of each page will appear on the left hand side of the screen while the associated resources from the 'back' of that page will appear on the right.

2934 North Delaware Street, Mapleton-Fall Creek neighborhood

Mapleton-Fall Creek Development Corporation 'Delaware Street Project' 2006

Context sensitive design and PATH technologies in a home affordable for an 80% MFI household. Winner of the 2006 HUD Secretary's Best in American Living Silver Award.

http://www.mfcdc.org

Executive Summary

Green building has matured considerably since its inception as a response to the energy crisis of the 1970s. Contemporary green building, or *high performance building*, emphasizes energy efficient construction, occupant health benefits derived from superior indoor air quality, and a greater regard for efficient use of our limited natural resources, including water. This means constructing homes that not only meet, but in many cases also exceed the requirements of current building and energy codes. Green houses need not employ fringe building techniques or technologies; most cannot be discerned as such by the unknowing observer.

An integrated design process is one of the keys to any successful green building project. To build a home that is more energy efficient, healthier, and more durable than standard construction it is necessary to engage the entire project team in the design and construction process from the beginning. Many green strategies rely on synergies between building systems and assemblies that are only possible when all of the components work together. For this reason, many green projects are front loaded with extra design and planning time and require greater construction oversight.

Case studies that have analyzed multi-family and mixed-use projects in urban settings have shown that the incremental costs to build green are between 2% and 4% of total development costs. These costs are difficult for developers to offset, especially when targeting homebuyers rather than the rental market. Most developers agree, however, that green projects are easier to market and sell than comparable projects that are not green. Developers that build green are perceived by the public as offering a higher quality product, and many consumers are willing to pay a premium for green features. This is especially true because green and high performance homes offer health benefits, lower utility bills, and a sense of personal and community environmental stewardship.

For the same reasons, affordable housing developers have every reason to build green. The low to moderate-income population has the least capacity to pay high utility bills and suffers disproportionately from respiratory illnesses linked to poor indoor air quality and environmental contaminants. Green affordable housing stays affordable for a longer period of time due to energy cost savings, leaving homeowners and renters with more discretionary income. Additionally, building maintenance and replacement intervals are extended adding further to overall affordability. Other long-term economic benefits should likewise not be discounted. Air quality, water quality, and worker productivity will be enhanced while public health problems and associated health care costs will be minimized. When green building is undertaken on a regional level the economic benefits can be substantial.

In Indianapolis, affordable housing development exists within the framework of community economic development. By offering consumers green options, affordable housing in Indianapolis will be differentiated from similarly priced homes available in outlying areas. Additionally, the marketing potential of a City Sustainability Initiative, coupled with the draw of urban living can be leveraged in a fashion similar to efforts underway in Chicago, Minneapolis, and Kansas City, MO, not to mention Seattle and Portland, OR. Green building also dovetails nicely with existing citywide investments such as Great Indy Neighborhoods, Clean Streams, the Abandoned and Vacant Housing Initiative, Recycle Indianapolis, and the overall home renovation and historic preservation ethic. The existing CDC infrastructure is uniquely positioned to tap green funding sources that exist today.

Executive Summary (continued)

Two of the greatest barriers to building green are a lack of understanding on the part of builders as to what it actually means to build green, and skepticism within the construction industry to alter timeworn building techniques that could potentially expose contractors to greater liability. Generally, green building is no more complex than standard construction, but rather focuses on achieving higher quality by adhering to industry best practices derived from building science research. It is also up to contractors to pay greater heed to the interconnectedness of various building systems: shell, fenestrations, mechanical systems, etc. For this reason, a thorough understanding of the underlying green concepts is essential. In order to build green within budgetary constraints, it is crucial that designers and builders alike fully understand the design elements that contribute to the green-ness of a given project. Architects and engineers often design within a mature green building paradigm, but contractors are better equipped to offer realistic input in the areas of job costing and prevailing construction practices. This is one reason why an integrated design and building approach is crucial to the success of green projects.

Likewise, traditional financiers are catching up to the design community when it comes to understanding green building. Lenders and insurers have been slow to appreciate the long-term benefits of healthy, energy efficient, resource efficient construction. Few objective analyses of the actuarial benefits of green building have been published. As such, financial products that leverage the cost-benefit of green development such as Location Efficient Mortgages and Energy Efficient Mortgages have been slow to come to market. The sales and marketing advantages afforded by green building are just now coming to the fore as sustainability issues permeate the mass media and 'green' remains a darling buzzword.

In order to move toward sustainable building practices in Indianapolis, several key changes must take place. One of the most effective green development incentives is to tie federal subsidy in the form of HOME and CDBG funds to green building standards. High performance building standards or guidelines can serve as the cornerstone of a more comprehensive, citywide sustainability initiative as well as a common point of reference for funders, designers, builders, and the general public. Embracing green building will also open up markets for related business enterprises such as green building product manufacturers and retailers, and specialty consultants and subcontractors. Additionally, as emerging green builders begin to manage their waste streams more effectively, illegal dumping will be reduced and recycling will increase. The development of new markets for construction and demolition waste materials will further drive economic development.

Green building has the greatest potential to effect significant environmental and economic changes in Indianapolis and across our region. Many cities in the U.S. and abroad have mature sustainability initiatives that focus on green building. As studies continue to quantify the benefits of green building, financial products that allow developers to capitalize on green building will help to transform the industry. Many financial incentives that target green and sustainable development are already available. Marketing Indianapolis as a green city will complement and enhance community and economic development initiatives already under way and open up new sources of community development funding. Making Indianapolis a green city will help to attract and retain the creative class in addition to paying health and economic dividends for all residents, now and into the future.

Contents

Why Green Building?

Natural Resource Consumption

25% - 30% of total U.S. wood & raw material consumption is used for buildings

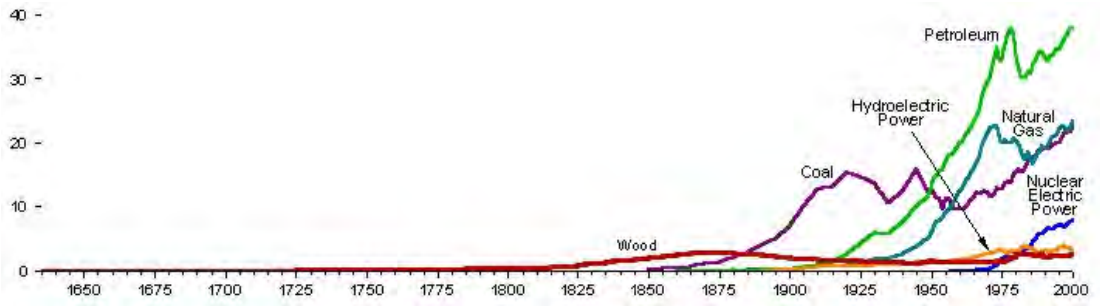
35% - 40% of total U.S. municipal solid waste stream is CDW – Construction Demolition Waste

25% of total U.S. water consumption is used for bathing, toilet flushing, and washing

Energy Consumption

30% - 40% of total U.S. energy consumption is devoted to constructing & operating buildings

60% - 70% of total U.S. electricity consumption is devoted to operating buildings



Energy Consumption by Source, 1635 - 2000 (quadrillion BTUs)

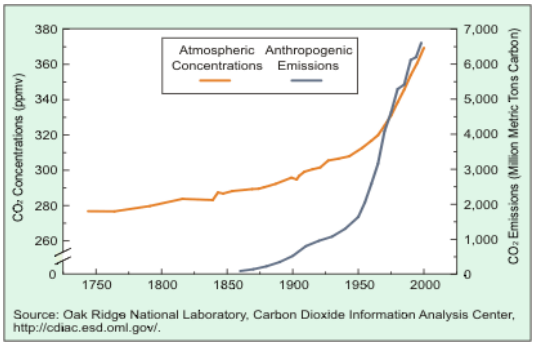
Energy Costs

will continue rising as resources & reserves are depleted

Climate Change

caused by CO_2 emissions

the scientific community agrees that we have a 10-year window in which to take action



Not Really Our Choice...

we have a duty to future generations to act now

Resources

An Inconvenient Truth http://www.climatecrisis.net

Clean Air – Cool Planet http://www.cleanair-coolplanet.org

Diamond, Jared, 2005, ***Collapse****: How Societies Choose to Fail or Succeed*, Viking Penguin

Diamond, Jared, 1999, ***Guns, Germs and Steel****: The Fates of Human Societies*, W.W. Norton & Company

editors of Earth Pledge, 2005, ***Sustainable Architecture White Papers***, Earth Pledge

Frome, Michael, 1996, ***Chronicling the West****: Thirty Years of Environmental Writing*, The Mountaineers

Grist http://www.grist.org

Natural Resources Defense Council http://nrdc.org

Oak Ridge National Laboratory http://www.ornl.gov/sci/eere

Reisner, Marc, 1986, ***Cadillac Desert****: The American West and Its Disappearing Water*, Viking Penguin

Rocky Mountain Institute http://www.rmi.org

Sustainable Indiana http://www.sustainableindiana.org

U.S. DOE Energy Information Administration http://www.eia.doe.gov

U.S. Mayors Climate Protection Agreement http://www.usmayors.org/climateprotection

Common Perceptions of Green Building

Green building is often associated with natural building techniques, complex alternative energy systems, expensive environmentally friendly materials, or an extreme lifestyle. While a few green homes and select practitioners may utilize some or all of these strategies to achieve greater sustainability, they occupy the outer reaches of the green building continuum.

Exotic Construction Techniques – Natural Building

straw bale

Earthship

Exotic Technology – Alternative Energy

solar PV panels

small-scale wind power

DC/AC inverter 'black box'

Exotic Materials – $$$

clay plaster wall finishes, cork & bamboo flooring, recycled glass tile, LED lighting, hemp fabrics

biocomposite panels & cabinetry, EcoSurfaces, Paperstone, and EnviroGLAS countertops

Maybe... more like a continuum...

Resources

Brownell, Blaine, 2006, ***Transmaterial**: A Catalog of Materials That Redefine our Physical Environment*, Princeton Architectural Press http://www.transstudio.com/tm

City Repair, Portland, OR http://www.cityrepair.org/wiki.php

Cope Environmental Center, Richmond, IN
http://www.copeenvironmental.org/property/sldh/sldh.htm

Corum, Nathaniel, 2004, ***Building One House**: A Handbook for Straw Bale Construction*, Red Feather Development Group http://www.redfeather.org

Environmental Home Center, Seattle, WA http://www.environmentalhomecenter.com

Greenmaker Building Supply, Chicago, IL http://www.greenmakersupply.com

Midwest Renewable Energy Association http://www.the-mrea.org

Natural Building http://www.greenhomebuilding.com

Skurka, Norma and Jon Naar, 1977, ***Design for a Limited Planet**: Living with Natural Energy*, Balantine Books

'The Giant', Pendleton, IN http://www.giantearthship.com/thegiant.htm

The Last Straw http://www.strawhomes.com

Treehugger http://www.treehugger.com

Principles of Green Building

Building Science

Green or 'high performance' design and building embodies evidence-based best practices derived from building science research.

Energy Efficiency

standard 'to code' construction practices rarely produce energy efficient buildings, but…

homes that are modestly sized, thoughtfully designed, and carefully built use less energy

25% - 40% annual energy savings is easily achievable with minimal additional expenditure

Resource Efficiency

thoughtfully designed, modestly sized homes can be constructed using less material

green buildings are more durable – extended maintenance intervals reduce replacement costs

water resources are managed & conserved

construction waste stream is managed & minimized

IAQ – Indoor Air Quality

Americans spend 90% of their time indoors

good IAQ is tantamount to good health outcomes, especially in children

many IAQ issues arise as a result of substandard construction

Integrated Design Process

owners, designers, and builders collectively identify feasible green strategies

fosters an environment of communication, cooperation, and collaboration early on

clearly defines what makes each project green

Resources

BuildingGreen.com BuildingGreen Suite https://www.buildinggreen.com/ecommerce/bgsuite.cfm?

Building Science Corporation http://www.buildingscience.com

Canadian National Research Council Institute for Research in Construction http://irc.nrc-cnrc.gc.ca/index_e.html

Environmental Design + Construction http://www.edcmag.com

GreenClips http://www.greenclips.com

Green Building Pages http://www.greenbuildingpages.com/main.html

HUD USER Affordable Housing Research & Technology Division http://www.huduser.org/research/tech.html

Johnston, David and Kim Master, 2004, ***Green Remodeling****: Changing the World One Room at a Time*, New Society

NAHB Research Center http://www.nahbrc.org/about.asp?TrackID=&CategoryID=1625&Type

National Building Museum **The Green House: New Directions in Sustainable Architecture and Design** http://www.nbm.org/Exhibits/greenHouse2/greenHouse.htm

Resource Venture http://www.resourceventure.org/rv/issues/building/introduction/index.php

U.S. DOE Energy Efficiency & Renewable Energy Building Technology Program http://www.eere.energy.gov/buildings/program_areas/index.html

U.S. Green Building Council http://www.usgbc.org/DisplayPage.aspx?CMSPageID=76&

USGBC Heartland Region http://usgbcheartlandregion.org

USGBC Indiana Chapter http://chapters.usgbc.org/indiana/join.html

West Coast Green Residential Building Conference + Expo http://www.westcoastgreen.com

Integrated Design Process

A common vision which spans the disparate concerns of owners, funders, designers, and builders often emerges from an integrated design process. This 'green design narrative' helps to establish priorities and clearly defines the project goals. It is imperative that the design intent is thoroughly digested by the entire project team before construction begins.

Many of the most effective green building strategies capitalize on synergies created when the full range of building systems are designed to work together. In this holistic approach, every building component informs and influences the design and specification of every other component, as well as the project as a whole. This tight integration is only possible through close collaboration between all members of the project team.

The Green Continuum – Green, Greener, Greenest

light green — dark green

high efficiency gas furnace	geothermal hydronic heating & cooling
25-year asphalt shingle roof	75-year metal roof
high efficiency, tank-style hot water heater	on-demand, tankless hot water heater
affordable homes	custom homes

all development projects are a balancing act…

core high performance building strategies	'green bling'
programmatic constraints	design whimsy
budget	wish list
financing terms	construction schedule

Makes Economic Sense

design-build approach is more economical than traditional design-bid-build paradigm

time invested in design & planning pays dividends in efficiency during construction

attempting to add green features once construction has started is an inefficient, costly strategy

Collaborative

plan early, plan often, plan for success

a collaborative effort is more likely to produce attractive & appropriate designs

affords a built-in opportunity for community involvement
- neighborhood-based groups
- historic preservationists
- social service providers

Resources

Affordable Housing Design Advisor http://www.designadvisor.org

Fanjoy, Rob, November 2004, ***Should You Design/Build?*** http://www.mydesignbuildcoach.com/articles/should_you_db.htm

Hale, Jonathan, 1994, ***The Old Way of Seeing****: How Architecture Lost its Magic (And How to Get it Back)*, Houghton Mifflin

Jacobson, Max with Murray Silverstein and Barbara Winslow, 2002, ***Patterns of Home****: The Ten Essentials of Enduring Design*, The Taunton Press

Ludwig, Art, 2003, ***Principles of Ecological Design****: Integrating Technology, Economics and Ecology*, Oasis Design

Shoshkes, Ellen, 1989, ***The Design Process****: Case Studies and Project Development*, Whitney Library of Design

Susanka, Sarah, 2001, ***Creating the Not So Big House***, The Taunton Press

Sustainable Buildings Industry Council http://www.sbicouncil.org/index.htm

Van der Ryn, Sim and Stuart Cowan, 1996, ***Ecological Design***, Island Press

Wilson, Alex and Nadav Malin, Environmental Building News September/October 1995, ***Establishing Priorities with Green Building*** http://www.buildinggreen.com/auth/article.cfm?fileName=040501a.xml

Energy Efficiency

It is important to draw a distinction between energy conservation and energy efficiency. Energy conservation means reducing overall energy consumption by addressing usage *rather than* utilization*. During the energy crisis of the 1970s, for example, president Jimmy Carter asked Americans to conserve energy by turning down their thermostats. At the time, furnaces did not utilize energy very efficiently, so reducing overall usage was an effective strategy.*

By contrast, many modern furnaces and water heaters, coupled with smart controls such as programmable thermostats, utilize energy very effectively – they are efficient. Traditional conservation measures continue to make economic sense, but as the energy efficiency of heating and cooling appliances rises, the return on energy conservation measures diminishes. Using energy more efficiently while employing practical energy conservation measures is a reasonable way to reduce overall consumption.

Key Affordability Strategy

3 – 6 year simple payback on initial investments

lowers operating costs over the entire usable life of the home

Achievable Without Exotic Technologies, *but...*

the devil is in the details
- well insulated, tightly sealed building shell
- low-e windows
- high efficiency furnace, air conditioner, hot water heater, refrigerator
- careful duct placement, sealing, and insulation
- fresh air circulation
- efficient lighting

not sexy, zero additional curb appeal

Alternative Energy Systems: Free Energy, *but...*

the economic viability of alternative energy systems depends on whole-house energy efficiency

alternative energy systems are *expensive at the moment*
- solar PV power
- solar domestic hot water
- solar hydronic heating
- geothermal heating
- wind power

very sexy, zero-energy & near-zero-energy homes exist *today*

Resources

Citizens Gas http://www.citizensgas.com/forhomes/energysaving.html

Conservation Services Group http://www.csgrp.com/index.html

Home Energy http://www.homeenergy.org

Home Power http://www.homepower.com

HUD, August 2006, ***Promoting Energy Efficiency at HUD in a Time of Change***
http://www.huduser.org/publications/destech/energyefficiency.html

HUD PATH Zero Energy Homes
http://www.toolbase.org/ToolbaseResources/level3.aspx?BucketID=2&CategoryID=58

Illinois Energy Efficient Affordable Housing Construction Program
http://www.commerce.state.il.us/dceo/Bureaus/Energy_Recycling/Energy/Energy+Efficiency/housing_energy_program.htm

Indiana Building Energy Symposium
http://www.bsu.edu/web/capic/ibesymposium/speakers.html

Indiana Coalition for Renewable Energy and Economic Development
http://www.indianacleanpower.org/takingaction.html

Indiana Energy Resources http://www.in.gov/oucc/publications/IndianaEnergyResources.html

Indiana Office of Utility Consumer Counselor
http://www.in.gov/oucc/publications/WinterTips.html

Indianapolis Power & Light, February 2004, ***75 Ways to Save Energy Around the Home***
http://www.iplpower.com/ipl/index?page=IPLGeneral&Menu=01050900&DocID=0205012bcd4b01091b0eeddb007ddb

Javna, John and The EarthWorks Group, 1990, ***30 Simple Energy Things You Can Do to Save the Earth***, Seattle City Light

Kilowatt Ours http://www.kilowattours.org

Lstiburek, Joseph, 2004, ***Builder's Guide to Cold Climates****: A systems approach to designing and building homes that are safe, healthy, durable, comfortable, energy efficient and environmentally responsible*, Building Science Press

Midwest Combined Heat and Power Application Center
http://www.chpcentermw.org/01-00_about.html

Midwest Renewable Energy Association http://www.the-mrea.org

Scheckel, Paul, 2005, ***The Home Energy Diet****: How to Save Money by Making Your House Energy Smart*, New Society

Resource Efficiency

The concept of resource efficiency in building design and construction has far-reaching implications. Renovating existing buildings, implementing low-impact development strategies, managing waste streams, purchasing locally produced materials, and installing low-flow shower heads all qualify as resource efficiency measures. Resource efficiency is perhaps the most broadly interpreted green building strategy, and offers the greatest potential for creative innovation as well.

LID – Low Impact Development

land use planning, engineering, and landscape architecture that is sympathetic to existing hydrology
- retain existing topography & drainage areas whenever possible
- engineer systems that functionally replicate natural systems

effective strategy for minimizing combined sewer overflow discharge events
- collect stormwater, then release it slowly – rain gardens, bio-swales, green roofs, rain barrels

Efficient Use of Building Materials

smaller building – smaller environmental footprint

durable building materials have longer replacement intervals

renovation & rehab projects save material resources compared to new construction

LCA – Life Cycle Analysis

quantifies the environmental impact of a product or process over the duration of its usable life
- cork & bamboo are rapidly renewable resources – plastics derived from oil are not
- locally produced materials drive the local economy & reduce transportation costs
- salvage & reuse of building materials conserves raw materials & saves manufacturing costs

the current paradigm in Indianapolis

is this sustainable?

Resources

10,000 Rain Gardens, Kansas City, MO http://www.rainkc.com/home/index.asp

Building LCA Project http://buildlca.rmit.edu.au/links.html

Cantacuzino, Sherban, 1989, ***Re-Architecture****: Old Buildings/New Uses*, Abbeville Press

Elkington, John with Julia Hailes and Joel Makower, 1990, ***The Green Consumer***, Viking Penguin

Goldbeck, Nikki and David, 1995, ***Choose to Reuse***, Ceres Press

HUD National Economic Service-life Tools http://www.pathnet.org/sp.asp?id=9710

Indianapolis DPW Clean Stream Team
http://www.indygov.org/eGov/City/DPW/Environment/CleanStream/home.htm

Keep Indianapolis Beautiful http://www.kibi.org

Litchfield, Michael, 1983, ***Salvaged Treasures****: Designing and Building with Architectural Salvage*, Van Nostrand Reinhold

Low Impact Development Center http://www.lowimpactdevelopment.org

Ludwig, Art, 2002, ***Create an Oasis with Greywater****: Your Complete Guide to Choosing, Building and Using Greywater Systems*, Oasis Design

McDonough Braungart Design Chemistry http://www.mbdc.com

Pople, Nicholas, 2003, ***Small Houses****: Contemporary Residential Architecture*, Universe Publishing

Resource Venture http://www.resourceventure.org/rv/issues/building/publications/index.php

Shopsin, William C., 1989, ***Restoring Old Buildings for Contemporary Uses***, Whitney Library of Design

Susanka, Sarah, 2001, ***The Not So Big House***, The Taunton Press

Indoor Air Quality

Indoor air quality refers to the quality of the air and environment inside homes relative to pollutant concentrations and conditions that can affect the health and comfort of occupants. Factors that affect IAQ include temperature and relative humidity as well as light and sound levels. Good IAQ is an essential component of any building, especially green buildings.

Creating a better indoor environment can help homeowners, architects and builders to minimize or eliminate the negative health effects, liability, bad publicity, and costly renovations and repairs often associated with IAQ problems. Improving IAQ involves designing, building, operating, and maintaining homes in ways that reduce pollution sources and remove indoor pollutants while ensuring that fresh air is continually supplied and circulated.

Radon (Rn)

leading cause of lung cancer among non-smokers, 2nd leading cause overall

U.S. EPA classifies Marion County as a 'Zone 1 – highest potential radon risk' area

Sick Building Syndrome

when occupants complain of non-specific symptoms linked to time spent inside a building

unknown causes, *but attributed to...*
- exhaust from bathrooms, kitchens, and vehicles
- biological contaminants such as pollen, bacteria, viruses, and molds
- VOCs & chemical off gassing
  - insulation
  - manufactured wood and pressed wood products
  - adhesives, caulks
  - paints, lacquers, varnishes, solvents
  - carpeting, upholstery
  - smoke
  - household cleaners
  - pesticides

Other Environmental Contaminants

asbestos & lead-based paint – more likely to be found in houses built prior to 1978

moist indoor air & stagnant pools of water – can lead to the formation of mold

Carbon monoxide (CO) – produced by incomplete combustion of natural gas and other fuels

Ozone & particulate matter – U.S. EPA classifies Marion County as a 'Nonattainment' area

Resources

American Lung Association http://www.lungusa.org/site/pp.asp?c=dvLUK9O0E&b=327043

Centers for Disease Control http://www.cdc.gov/niosh/topics/indoorenv/

Pearson, David, 1998, ***The New Natural House Book***: *Creating a Healthy, Harmonious, and Ecologically Sound Home*, Fireside

U.S. Consumer Product Safety Commission http://www.cpsc.gov/cpscpub/pubs/iaq.html

U.S. EPA Green Book http://www.epa.gov/oar/oaqps/greenbk/index.html

U.S. EPA Lead Awareness Program http://www.epa.gov/lead

U.S. EPA Map of Indiana Radon Zones http://www.epa.gov/radon/zonemap/indiana.htm

U.S. EPA Indoor Air Quality http://www.epa.gov/iaq/

U.S. EPA, December 1991, ***Building Air Quality***: *A Guide for Building Owners and Facility Managers* http://www.cdc.gov/niosh/baqtoc.html

Why Green Affordable Housing?

Energy Efficient

low to moderate-income renters & homeowners realize the greatest benefit from lower utility bills

Resource Efficient

durable construction decreases maintenance costs & total cost of ownership

rental housing needs to be durable

Healthy

low to moderate-income population disproportionately suffers from respiratory illnesses

uninsured low to moderate-income population is least likely to seek preventive health care

Makes Long-Term Economic Sense

green affordable housing is attractive to young, creative class homebuyers

additional discretionary income drives local economic development

a healthier workforce is more productive

a healthier population eases the collective tax burden – reduced need for subsidized health care

attractive, energy efficient, durable homes build lasting community wealth

Resources

Enterprise Green Communities Executive Summary
http://www.greencommunitiesonline.org/documents/executivesummary.pdf

Enterprise Green Communities http://www.greencommunitiesonline.org/resources.asp

Fannie Mae Foundation KnowledgePlex
http://www.knowledgeplex.org/search.html?key=metadata&value=green+affordable

Green Affordable Housing Coalition http://www.greenaffordablehousing.org

HUD PATH Resources for Affordable Housing Providers
http://www.pathnet.org/sp.asp?mc=ln_housingprov

Jones, Tom with William Pettus and Michael Pyatok, 1997, *Design for Living, Good Neighbors:* ***Affordable Family Housing***, McGraw-Hill

Minnesota Home-Smart http://www.home-smart.org

National Center for Appropriate Technology Smart Communities Network
http://www.smartcommunities.ncat.org/buildings/affhousing.shtml

National Housing Institute http://www.nhi.org/index.html

Smart Homeowner http://www.smart-homeowner.com

Why Community & Economic Development?

Strong CDC Infrastructure

affordable housing programs already focus on rehab & urban infill projects

major annual impact – DMD is funding at least 56 new affordable homes in 2007
- *minimum* of 33 rehab projects
- *minimum* of 23 new construction urban infill projects

CDCs can leverage non-profit status to tap existing funding sources for green affordable housing

Existing City Initiatives

Great Indy Neighborhoods
- several neighborhoods have already identified green building as a priority

Abandoned & Vacant Housing
- will feed rehab & preservation projects

Brownfields Redevelopment
- will feed new construction & urban infill redevelopment projects

Clean Streams
- will address water conservation, stormwater and combined sewer overflow management

Recycle Indianapolis
- *could also handle CDW diversion – would address illegal dumping & support greener building*

Strong Preservation Ethic

historic preservation projects are inherently green
- beautiful buildings are maintained, ugly buildings are neglected

who in the coming decades will rehab the homes being built today?
- what is the average lifespan of a new affordable home? 15 years, 30 years, 100 years?

Indianapolis Is a 'Show Me' Town...

policy makers, lenders, funders, developers, architects, consultants, builders, manufacturers, suppliers, realtors, homeowners…*can learn together*

Resources

Ball State University CAP:IC College of Architecture and Planning: Indianapolis Center
http://www.bsu.edu/capic/index.html

Center for Neighborhood Technology http://www.cnt.org

Ecocity Builders http://www.ecocitybuilders.org/index.html

Edens Lost & Found http://www.edenslostandfound.org

Fannie Mae Foundation http://www.fanniemaefoundation.org/about/index.shtml

GINI Great Indy Neighborhoods Initiative http://www.greatindyneighborhoods.org/getconnected/index.html

Hough, Michael, 1990, ***Out of Place**: Restoring Identity to the Regional Landscape*, Yale University Press

HUD Office of Policy Development & Research http://www.huduser.org/

Indianapolis DMD Abandoned Housing Initiative
http://www.indygov.org/eGov/City/DMD/Abandoned/reports.htm

Baird, Bruce with Jeff Bennett, Eugene Lausch, Andrew Seiwert, Frank Alexander and Lisa Mueller Levy, September 2006, ***Abandoned Property in Indiana*** http://www.hundredyear.org/abandoned.aspx

Indianapolis DMD Brownfields Redevelopment Program http://www6.indygov.org/dmdplan/brownfields

Indianapolis DPW Clean Stream Team
http://www.indygov.org/eGov/City/DPW/Environment/CleanStream/home.htm

IndyGov List Server http://www6.indygov.org/listserv

Jacobs, Jane, 1993, ***The Death and Life of Great American Cities***, Modern Library

Kunstler, James Howard, 1994, ***The Geography of Nowhere**: The Rise and Decline of America's Man-Made Landscape*, Touchstone

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Yudelson, Jerry, Home Energy, July/August 2006, ***Twelve Reasons Why the Green Home Market Is Ready to Surge*** http://greenbuildconsult.com/pdfs/HEM_23-4_tr-grmarketing.pdf

Price Premium to Build Green

Depends On...

project type

multi-family projects, production homebuilders, redevelopment areas – rely on economy of scale

scattered site urban infill – logistically more complex than new greenfield development

new construction – fairly straightforward

rehab & renovation – need to budget for unknowns

project budget & intended market

affordable for 30% AMI, 50% AMI, 80% AMI households

market rate development

custom homes

tankless water heater – dark green

Location on Green Continuum

'light green' $
- basic energy efficiency measures
- durable materials
- improved IAQ

'dark green' $$$
- all of the above
- alternative energy systems
- exotic materials
- exotic technology
- exotic construction techniques

Incremental cost to build green is generally 2% - 4% of total development costs

Probably $2000 - $3500 per unit for single-family homes

greener than standard construction – light green features only

'greenwashing' – installing only green finish materials – is not an effective strategy

Resources

Cushman, Ted, Green Builder, November 2006, ***LEED for Homes Rolls Out***
http://www.greenbuildermag.com/pdf/GBM_Nov_Pgs33_46.pdf

Kats, Greg with Leon Alevantis, Adam Berman, Evan Mills and Jeff Perlman, 2003,
The Costs and Financial Benefits of Green Building
http://www.cap-e.com/spotlight/index.cfm?Page=1&NewsID=25770

New Ecology, 2006, ***Costs and Benefits of Green Affordable Housing***
http://www.newecology.org/cb%20description.htm

Resource Venture Costs to Build Green
http://www.resourceventure.org/rv/issues/building/get-started/transition/costs/index.php

Financial Incentives for Green Affordable Housing

Home Depot Foundation

Enterprise Community Partners

Green Communities – 5 year, $555M initiative announced in 2005
- $5M technical assistance grants
- $50M predevelopment & property acquisition loans
- $500M tax credit equity fund for building & capital improvements

Ohio, Michigan & Minnesota have successfully tapped this funding source

Enterprise & USGBC will jointly address green affordable housing issues in 2007

LISC – Local Initiatives Support Corporation

provides technical assistance resources for green development projects

funding for green projects is forthcoming…

Federal, State & Local Programs

U.S. Energy Policy & Conservation Act of 2005 offers tax incentives

Indiana Office of Energy & Defense Development offers grants

LIHTC may be targeted toward green projects through IHCDA's Qualified Allocation Plan

HOME, CDBG subsidy may be targeted toward green projects through DMD's Annual Action Plan

Green Mortgages, Green Insurance

allow consumers to capitalize on energy saving, increased durability, and health benefits

FHA approved lenders offer limited energy & location efficient mortgages

Local Community Development Lenders

National City Bank

Community Choice Federal Credit Union

Resources

Community Choice Federal Credit Union
http://www.communityinvestingcenterdb.org/profile.cgi?id=345;mode=program

Community of Science Funding Opportunities http://fundingopps.cos.com/about/fundingopps.shtml

Enterprise Community Partners http://www.enterprisecommunity.org

Enterprise Green Communities http://www.greencommunitiesonline.com

Federal Housing Administration http://www.hud.gov/offices/hsg/fhahistory.cfm

Funding Green Buildings http://www.fundinggreenbuildings.com

Home Depot Foundation http://www.homedepotfoundation.org/support_housing.html

HUD Incentives http://www.pathnet.org/sp.asp?id=18323

Indiana offers property tax deductions for the **installation of geothermal technologies**. For more information please contact Donna Palmer with the Indiana Department of Environmental Management, Office of Water Quality at (317) 233-0478. See Indiana State Form 18865 http://www.in.gov/icpr/webfile/formsdiv/18865.pdf

Indiana offers property tax deductions for the **installation of solar and wind technologies**. For more information please contact your local county auditor or county assessor. See Indiana State Form 18865 http://www.in.gov/icpr/webfile/formsdiv/18865.pdf

Indiana offers state income tax exemptions for the **installation of insulation**. See Indiana Department of Revenue Form IT-40, p. 11 http://www.in.gov/dor/taxforms/05pdfs/05-it40bk.pdf

Indiana Office of Energy & Defense Development http://www.in.gov/energy/programs/current.html

Local Initiatives Support Corporation http://www.lisc.org/section/areas/smartgrowth/green_dev

National City Bank
http://www.nationalcity.com/about/CommuReinvestment/IndianaProjects/default.asp

New Resource Bank http://www.newresourcebank.com

Tax Incentive Assistance Project http://www.energytaxincentives.org

Next Steps

Prioritize Green Building in Indianapolis

Indianapolis Office of the Mayor
- brand green building programs under a comprehensive citywide Sustainability Initiative
- educate the public about the benefits of green & sustainable development
- publicize local green projects, both public & private
- market Indianapolis as a world-class *green* city

Implement Policy Changes that Favor Green Projects

DMD, IHCDA
- link federal affordable housing subsidy programs to green building guidelines or standards
  - LIHTC, HOME, CDBG

DMD
- prioritize & 'fast track' green development projects
  - reduce permit fees, expedite permitting, provide additional staff support

DMD, IHPC, MDC, MPO
- adopt green amendments to building codes, preservation guidelines & development standards
  - green building best practices, urban design guidelines, land use & transportation plans

City-County Council, Indiana General Assembly
- mandate LEED certification for publicly funded capital improvement projects

Expand CDC Capacity to Develop Green Projects

ICND, LISC
- develop guidelines and adopt green building standards for affordable residential projects

DMD, ICND, INRC, Ball State CAP:IC, Purdue Cooperative Extension, LISC, others…
- develop a green building resource center
- educate homeowners, architects, and builders

LISC, INHP, Citizens Gas, Indianapolis Power & Light, National City, others…
- develop flexible local funding sources for green building projects
- tap existing resources to assemble layered 'green financing' packages

Foster Market Transformation

Marion County Health Department, Polis Center, SPEA
- conduct further studies to quantify the health & economic benefits of green development

DPW, Keep Indianapolis Beautiful
- develop CDW recycling options for residential scale projects
- develop local markets for CDW material

Resources

Ball State University CAP:IC http://www.bsu.edu/capic/education.html

City of Chicago Center for Green Technology http://www.cityofchicago.org/environment/greentech

City of Indianapolis Office of the Mayor http://www.indygov.org/eGov/Mayor/home.htm

City of Indianapolis and Marion County City-County Council
http://www.indygov.org/eGov/Council/home.htm

City of Portland G-Rated http://www.portlandonline.com/osd/index.cfm?c=41481

City of Seattle Green Building Program http://www.seattle.gov/dpd/GreenBuilding

City of Seattle Green Building Program 2006 Review
http://www.seattle.gov/dpd/news/20061207a.asp

Columbus Green Building Forum, Columbus, OH http://www.cgbf.org/index.html

Ecology House, Indianapolis, IN http://www.ecologyhouse.com

Environmental House, Ann Arbor, MI http://www.environmentalhouse.org

Green Building Institute, Jessup, MD http://www.greenbuildinginstitute.org

Green Building Resource Center, Santa Monica, CA http://www.globalgreen.org/gbrc/index.htm

Green Roundtable http://www.greenroundtable.org/about_GRT.html

HUD, November 2006, ***Residential Market Research for Innovation***
http://www.pathnet.org/sp.asp?id=20983

Indiana General Assembly http://www.in.gov/legislative

Local Government Commission http://www.lgc.org/about/index.html#mission

Marion County Health Department http://www.mchd.com/pd.htm

NeighborWorks http://www.nw.org

New York State Green Building Tax Credit Program
http://www.gorr.state.ny.us/08_23_01_GreenBuildings.htm

Northwest EcoBuilding Guild, Seattle, WA http://www.ecobuilding.org

Purdue University Cooperative Extension Service http://www.ces.purdue.edu/marion

Sustainable Evansville, Evansville, IN http://www.sustainableevansville.org

SustainLane Government http://www.sustainlane.us/home.jsp

2172 North Pennsylvania Street, Herron-Morton neighborhood

Ecology House – Aercon, Inc. 'Perfect Home' 2003

Combines a super-insulated building shell with a high efficiency geothermal HVAC system. Average monthly bill for heating, cooling & lighting is $60.

http://www.aerconind.com/aercon_3

2900 block of North Delaware Street, Mapleton-Fall Creek neighborhood

Mapleton-Fall Creek Development Corporation 'Delaware Street Project' 2006

New construction blends seamlessly with the existing architectural fabric of the neighborhood. These compact, efficient designs easily support a family of four in under 1700 square feet.

http://www.mfcdc.org

Glossary

AMI Area Median Income (see also *MFI Median Family Income*); the middle income level in a particular metropolitan area; 50% of households earn *more*, and 50% of households earn *less* than the Area Median Income

brownfield previously developed property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant http://www.indygov.org/eGov/City/DMD/ED/Brownfields/home.htm

CDBG Community Development Block Grant; a federal community development program supported by HUD; CDBG funds are administered by DMD in Indianapolis, by IHCDA in other parts of Indiana http://www.hud.gov/offices/cpd/communitydevelopment/programs/

CDC Community Development Corporation; typically non-profit agencies that support neighborhoods by providing housing production, economic development, and an array of social support services http://imaps.indygov.org/ed_portal/template.asp?page=neighborhoods_cdcs

CDW (also C&D Waste) Construction Demolition Waste; typically consists of wood, metal, concrete, masonry & brick, gypsum drywall, vinyl siding & PVC piping, asphalt shingles, carpet & carpet padding www.hundredyear.org/cdw.aspx

creative class a group believed by some sociologists to be a key driving force for economic development of post-industrial cities in the U.S. http://en.wikipedia.org/wiki/Creative_class

deconstruction the systematic disassembly of a building, usually to salvage building materials http://www.resourceventure.org/rv/issues/building/get-started/cons-wste-mgmt/deconstruction/index.php

DMD City of Indianapolis Department of Metropolitan Development http://www.indygov.org/eGov/City/DMD/Community/Grants/home.htm

DOE U.S. Department of Energy http://www.energy.gov/organization/labs-techcenters.htm

DPW City of Indianapolis Department of Public Works http://www.indygov.org/eGov/City/DPW/home.htm

EPA U.S. Environmental Protection Agency http://www.epa.gov

GINI Great Indy Neighborhoods Initiative; a neighborhood-driven community development partnership currently underway in six Indianapolis neighborhoods http://www.greatindyneighborhoods.org/

Glossary

greenfield land on the periphery of an existing developed area on which there has been no previous development; in Indiana, generally refers to undeveloped agricultural land

greenwash a deceptive marketing technique; *at best*, a veneer of green finish materials installed on top of otherwise 'standard' construction; *at worst*, demonstrably false claims about the environmental performance of a company, product, or service

high performance building green building

HOME a federal affordable housing program supported by HUD; HOME funds are administered by DMD in Indianapolis, by IHCDA in other parts of Indiana
http://www.hud.gov/offices/cpd/affordablehousing/programs/home/

HUD U.S. Department of Housing and Urban Development http://www.hud.gov

HVAC Heating, Ventilation & Air Conditioning http://en.wikipedia.org/wiki/HVAC

hydrology relating to the movement, distribution, and quality of surface and ground water
http://ga.water.usgs.gov/edu/dictionary.html

IAQ Indoor Air Quality (also IEQ Indoor Environmental Quality)
http://www.epa.gov/iaq/ia-intro.html

ICND Indianapolis Coalition for Neighborhood Development; a non-profit umbrella organization that facilitates communication, cooperation and collaboration between CDCs
http://www.icndindy.org

IHCDA Indiana Housing and Community Development Authority
http://ihcda.in.gov/nonprofits_programs.aspx

IHPC Indianapolis Historic Preservation Commission; a nine member board appointed by the mayor with a professional staff; operates as a division of the City of Indianapolis DMD
http://www.indygov.org/eGov/City/DMD/IHPC/home.htm

INHP Indianapolis Neighborhood Housing Partnership; a non-profit organization that provides mortgage and credit counseling to low-moderate income homebuyers http://www.inhp.org

INRC Indianapolis Neighborhood Resource Center; a non-profit organization that assists neighborhood-based groups through Asset Based Community Development; GINI partner
http://www.inrc.org

Glossary

LCA Life Cycle Analysis; a way to objectively quantify the environmental impact of a product or process, generally in terms of embodied energy, over the duration of its usable life http://www.gdrc.org/uem/lca/life-cycle.html

LEED Leadership in Energy and Environmental Design; a green building rating system developed by the United States Green Building Council http://www.usgbc.org/DisplayPage.aspx?CategoryID=19

LIHTC Low Income Housing Tax Credits; an indirect federal subsidy used to finance the development of affordable *rental* housing for low-income households; LIHTC are administered by IHCDA in Indiana http://www.hud.gov/offices/cpd/affordablehousing/training/web/lihtc/basics

LISC Local Initiatives Support Corporation; a national community and economic development organization with offices in Indianapolis; GINI partner http://www.lisc.org/indianapolis

low-e low-emittance; an invisible film or coating that helps prevent heat loss through window glass http://www.efficientwindows.org/lowe.cfm

MDC Metropolitan Development Commission; a nine member board jointly appointed by the mayor, the Indianapolis-Marion County Council, and the Marion County Board of Commissioners that reviews and adopts changes to the Indianapolis-Marion County Comprehensive Land Use Plan http://www6.indygov.org/indianapolisinsight

MFI Median Family Income; AMI adjusted for household size; a common threshold for eligibility in *low-income* housing programs is 80% MFI, eligibility for *very low-income* housing programs is 50% MFI http://www.indygov.org/eGov/City/DMD/Community/Forms_Policies/grants.htm

MPO Metropolitan Planning Organization; a federally mandated professional planning body that is responsible for comprehensive regional transportation planning; operates as a division of the City of Indianapolis DMD http://www.indympo.org/home.htm

NAHB National Association of Homebuilders; a trade association that helps promote the policies that make housing a national priority http://www.nahb.org

PATH Partnership for Advanced Technology in Housing; a public-private partnership for advancing housing technology; serves as a clearinghouse for HUD sponsored building science research http://www.pathnet.org/index.asp

PV (also solar PV) photovoltaic; a technology that transforms light, usually sunlight, into electricity http://www.eia.doe.gov/cneaf/solar.renewables/page/solarphotv/solarpv.html

Glossary

R-value a measure of resistance to heat flow; a rating metric for insulation; *higher* R-values indicate a greater capacity to prevent heat loss
http://www.efficientwindows.org/glossary.cfm

SPEA School of Public & Environmental Affairs at Indiana University, Purdue University Indianapolis http://www.spea.iupui.edu/index.asp

u-factor (also u-value) inverse of R-value; a rating metric for door and window assemblies; *lower* u-factors indicate a greater capacity to prevent heat loss
http://www.efficientwindows.org/ufactor.cfm

USGBC United States Green Building Council; a national non-profit organization dedicated to sustainable building design and construction; developers of the LEED building rating system
http://www.usgbc.org

VOC Volatile Organic Compound; chemicals present in many building materials and household products http://www.epa.gov/iaq/voc.html

northwest corner of West 16th Street & North Dr. Martin Luther King, Jr. Drive

State Office Building Commission, State of Indiana Forensic & Health Sciences Laboratories (rendering.)
Completed 2006, LEED Silver application pending.

Ratio Architects, A_2SO_4 Architecture

hundredyear

green building consulting

construction management